Title: Escape from the Zoo and the Clean Up Crew

Brief Overview:

These lessons introduce the concept of skip counting. It is expected that students are familiar with addition and subtraction facts to ten. During these lessons the students will help Ziggy the Zookeeper from The Zany Zoo help capture all the animals that have escaped from their cages. These lessons will increase students' knowledge of skip counting forward by twos, fives, and tens, as well as skip counting backwards by tens from any given two-digit number.

NCTM Content Standard:

- Understand patterns, relations, and functions
 - Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
 - o Analyze how both repeating and growing patterns are generated.

Grade/Level:

Grade Two

Duration/Length:

Three 60-minute sessions

Student Outcomes:

Students will:

- Represent and analyze numeric patterns using skip counting by two, five, and ten starting with any whole number and using whole numbers to 100.
- Represent and analyze numeric patterns using skip counting backward by 10s starting with any two-digit whole number.

Materials and Resources:

Day 1

- Teacher resource "Pre-Assessment Mystery Number Sort" (3 pages) duplicate onto three different colors and cut apart prior to lesson
- Student resource "Pre-Assessment"
- Teacher resource "Pre-Assessment Answer Key"
- Fiction book <u>If Anything Ever Goes Wrong at the Zoo</u> by Mary Jean Hendrick (ISBN: 0152010092)
- Student resource "Animal Cage Patterns"
- Animal crackers, unifix cubes or another type of counter (16-20 per student)
- Chart paper and markers

- Dry erase boards, markers, and erasers
- Student resource "Number Chart Game Board" (duplicate 1 game board per pair of students)
- Different colored game pawns (2 per pair of students)
- Number cubes (1 per pair of students)
- Number cubes with addition and subtraction signs (3-4, enrichment group only)
- Student resource "Number Chart Game Board" (shaded version)
- Student resource "Exit Ticket"

Day 2

- Small, soft ball for tossing
- Pattern blocks
- Teacher Resource, "Exploring Skip-Counting with Pattern Blocks" overhead transparency
- Student resource "Exploring Skip-Counting with Pattern Blocks"
- Teacher resource "The Zany Zoo Map" overhead transparency
- Student resource "The Zany Zoo Map" (1 per pair of students)
- Chart paper and markers
- Student resource "Animal Art Planning Card"
- Variety of materials to create animals: construction paper, tissue paper, google eyes, etc.
- Student resource "Hundreds Chart" (reteach group only)
- Student resource "Pinch Card ABCD"
- Teacher resource "Assessment Pinch Card Question Sheet"

Day 3

- Teacher resource "Sort by Patterns-2s, 5s, 10s," (3 pages) cut apart prior to lesson
- 10 blocks from base 10 block sets (every pair of students)
- Chart paper and markers
- Student resource "Animal Rescue Recording Sheet" (may want to duplicate front to back)
- Teacher resource "Animal Rescue Recording Sheet" overhead transparency
- Colored cubes sorted by color into bins
- Yarn precut into strips
- Student resource "Hundreds Chart" (reteach group only)
- Student resource "Enrich Spinner" (enrich group only)
- Student resource "The Zany Zoo Summative Assessment"
- Teacher resource "The Zany Zoo Summative Assessment Answer Key"

Development/Procedures:

Day 1

Pre-assessment

- Distribute student resource "Mystery Number Sort Cards" by taping a card to the back of each student. Each color represents a different skip count sequence.
- Ask students to put themselves in order by color. Once in their colored groups students will observe their cards on their classmates and determine the number pattern.
- Students will work together to order themselves from least to greatest using the strategy of skip counting. Students should place their finished products in a location in the classroom. The pattern that the students created will be referred to at the completion of the lesson.
- Have the students complete student resource, "Pre-Assessment," to demonstrate what they know about patterns. Collect and review all responses using teacher resource "Pre-Assessment Answer Key".

Engagement

Read the fiction book, <u>If Anything Ever Goes Wrong at the Zoo</u>, by Mary Jean Hendrick. Discuss how Leslie, the little girl in the story, solves the problem by inviting the animals to her house.

Exploration

- Set up the scenario for the students. Tell them that you have received a phone call from Ziggy the Zookeeper of the Zany Zoo. He is frantic because all of the animals have escaped from their cages. He desperately needs your help to get the animals back in their cages as soon as possible. Help!
- Distribute student resource "Animal Cage Patterns," and 16-20 animal crackers or unifix cubes per student.
- Share with the students that their job is to put the animals back in their cages. Tell students each cage can only hold two animals.
- Provide time for students to explore. Make anecdotal notes as the students work through the problem.

Explanation

- Call the students to a whole group area in the room.
- Ask the students to turn and talk with a partner about the following questions:
 - What number pattern did you notice?
 - o If you were to add two more animals to one more cage, how many animals would you have in all?
- Record all responses on chart paper.
- Use think-pair-share and ask the students to think of other examples where they might need to count by twos. Record responses as students are sharing. Emphasize to the students that logical patterns exist, are regular occurrences, can be done with words and symbols, and the same pattern can be found in different forms (shapes, numbers, etc.).
- Challenge a student to a race of counting to twenty. The student must count by ones and you will count by twos. Discuss why counting by twos is much faster.
- Write eight on the board and model for the students how to count by two starting with eight. As you are saying the numbers, model how to write the sequence

- using commas to separate the numbers. Continue modeling with a few more examples.
- Have the students return to their individual seats. Give students different numbers to start with, from 1 to 100, and have them skip count by twos on dry erase or individual chalkboards. Encourage them to use each other as a resource for help.
- After three or four examples, tell the students that they will practice counting by twos by playing a game.

Application

- Divide students into pairs.
- Give each pair of students a copy of student resource "Number Chart Game Board" two different colored pawns, number cube, and a cube with four addition and two subtraction signs (enrichment group only).
- Explain that the hundreds chart will be used as a game board, with both pawns starting at zero. The first player rolls the number cube and skip counts by two the number of times indicated on the number cube. For example, if the number rolled on the number cube was three, the player should land on six when starting at zero. The second player then rolls the number cube and skip counts by two the number of times indicated on the number cube. Players continue until the first player reaches 100.
- Observe the students as they work.

Differentiation

Reteach

Use student resource "Number Chart Game Board" with pre-shaded spaces skip counting by twos.

Enrich

After the number twenty, players should roll both cubes and either move forward or backward, depending upon the addition or subtraction sign.

Assessment

Have the students summarize the lesson by revisiting their colored card sequences and giving them a chance to change the order. Have each group stand and share their patterns.

Distribute student resource "Exit Ticket" to each student and have them complete it independently.

Day 2

Engagement

Play "Ball Toss" with students to reinforce skip counting. Have everyone stand in a circle with you holding a ball. Tell the students that the rule is to skip count by twos. As you toss the ball, say the number two. The student that catches the ball should say four

and toss to another student. Continue for a few more passes as students skip count by twos

Exploration

- Display a pattern block on the overhead. Ask the students: "What do you notice about the number of sides for this shape? What happens to the total number of sides when I add one more of the same shape?" Tell the students to turn and talk about their observations.
- Display the transparency teacher resource "Exploring Skip-Counting with Pattern Blocks" and model how to complete the t-chart with the pattern blocks.
- Distribute pattern blocks and student resource "Exploring Skip-Counting with Pattern Blocks" to individual students.
- Observe the students as they explore and record.

Explanation

- Discuss the findings with the students.
- Tell the students that you have a map of the Zany Zoo and it follows these same patterns. It's our job to study the map in order to help Ziggy the Zookeeper return the animals to their cages.
- Display teacher resource "The Zany Zoo Map" on an overhead transparency and begin to navigate through the map to show the students the various patterns. As you find the patterns, write the skip counting sequences on/below the symbols.
- Distribute student resource "The Zany Zoo Map" to students (either table groups, pairs or individually) to continue finding more skip counting sequences.
- Have various students share their findings by writing the skip counting sequences on the overhead transparency. Students should use thumbs up/thumbs down to show agreement/disagreement. Monitor this activity and help students understand the patterns. Suggested questions for further discussion:
 - What pattern occurred most frequently on the map?
 - What do you notice about the numbers in the sequence 5, 10, 15, 20, 25, 30, etc.? (Hint: pay attention to the ones place)
 - o If an additional symbol were added, what skip counting, other than twos, five, or tens, could be used to label the pattern on the map?
- Have the students stand at their seats.
- Ask students to count by twos while gently tapping their shoulders.
- Ask students to count by fives while gently patting their legs.
- Ask students to count by tens while snapping their fingers.

Application

- Tell the students that they are creating some of the animals from the Zany Zoo. Brainstorm and list on chart paper some animals that belong in a zoo.
- Students need to decide the skip counting sequence and number patterns by independently completing student resource "Animal Art Planning Card." The animals can be real or imaginary.

- Share with the students materials they can use to create their animal (i.e. construction paper, tissue paper, google eyes, etc.).
- Students create their animals while you monitor to be sure that they are adding the skip counting sequence to the various parts of the animals.

Differentiation

Reteach

Complete the activity with a small group using the same animal and skip count together. Have the students color code the skip counting on student resource "Hundreds Chart," before they label the skip counting on the animal.

Enrich

Complete the same activity but encourage the students to use skip counting sequences beyond twos, fives, and tens.

Assessment

Students will use pinch cards, student resource "Pinch Card ABCD," with four letter choices. Read and show a sequence from teacher resource "Assessment Pinch Card Question Sheet" on an overhead transparency while students pinch the letter that best represents the next number in the skip counting sequence.

Day 3

Engagement

Distribute teacher resource "Sort by Patterns-2s, 5, 10s," cards to the students. The cards have three numbers in order from least to greatest or vice versa. Students must first determine the skip counting pattern before they can find the other cards that might come before or after their card. As students put themselves in order, they should stand with their group and be ready to share. They should be able to tell about the skip counting sequence and how they determined the pattern.

Exploration

- Distribute the 10 blocks from base 10 block sets for every pair of students.
- Tell students to start from 10 and count up to 50 using the 10 blocks. Continue practicing counting up by 10 starting with different multiples of ten.
- Tell students to count up by 10 starting with any two-digit number, such as 32. Some students may require the use of a hundreds chart to help them understand the pattern. Continue practicing.
- Tell students to count backwards by 10 starting with 90 using the 10 blocks. Continue practicing backwards by 10 starting with different multiples of ten.
- Tell students to count backwards by 10 starting with any two-digit number, such as 56. Some students may require the use of a hundreds chart to help them understand the pattern. Continue practicing.

Explanation

- Assemble students as a whole group.
- Write on the board or chart paper the skip counting sequences for 10. Write number sequences that progress forward and backward. Also include skip counting by multiples of ten as well as skip counting starting with any two-digit numbers.
- Discuss each sequence and what really changes as the sequences progress (the value of the tens place).
- Students can continue practicing by having a relay race. Students should stand in groups of 4-5. The first person should have the dry erase board and marker and be ready to begin the sequence given by you. The board is then passed to the second person and they write the next number in the skip counting sequence. This continues until everyone in the group has had a turn. Continue playing the game using examples similar to those introduced earlier in this part of the lesson.

Application

- Tell the students Ziggy contacted you last night with the exact number of each type of animal missing from Zany Zoo! With this information the Clean-Up Crew can begin their mission to put the missing zoo animals back in their homes.
- Distribute student resource "Animal Rescue Recording Sheet" and explain how to complete the chart using teacher resource "Animal Rescue Recording Sheet" on an overhead transparency.
- Tell the students that while you're cleaning up the zoo, it is important to take careful notes and record your findings as you collect the animals. This way we can make sure we do not leave any animals behind. Students will use the recording sheet to keep track of the amount of animals they have collected.
- Students will use colored cubes to represent each type of animal (e.g. green = alligators). The students will need to use pre-cut pieces of yarn, placed into circles, to separate each group of ten. The students will then skip count using ten to find the number of animals. Each group will have a few remaining animals. This information can be recorded on the student resource. The students should then add the two numbers together to find the total number of animals.
- Provide time for the students to work. Rotate the containers of colored cubes to the small groups until everyone has completed their charts. Monitor the groups as they work.
- Discuss the results with the whole group.

Differentiation

Reteach

Using the colored cubes and the charts from the previous activity, have a small group of students show you how they determined the total number for an animal. Practice skip counting by tens both forward and backwards. Student resource "Hundreds Chart" is a good resource.

Enrich

With a partner, students will take turns spinning a student resource "Enrich Spinner." The first player will skip count forward (five numbers only) by the number indicated on the spinner. For example, the first player spins a five, so the first player would skip count 5, 10, 15, 20, and 25. The second player spins a four, so the second player would start skip counting from 25, and would then say 29, 33, 37, 41, and 45. This would continue until 100 is reached. At that point, both players would need to skip count backwards by the number indicated on the spinner.

Summative Assessment:

Distribute student resource "The Zany Zoo Summative Assessment". The students will identify patterns for skip counting sequences. The students will write the next or missing numbers in a skip counting sequence. The students will answer a BCR based on the identification of a number pattern and explain how they determined the pattern. Teacher resource "The Zany Zoo Summative Assessment Answer Key" is available for evaluating the summative assessment.

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DAY 1 MATERIALS

Mystery Number Sort - 2s

Pre-Assessment

2	4	6
8	10	12
14	16	18
20	22	24
26	28	30

Mystery Number Sort - 5s

Pre-Assessment

5	10	15
20	25	30
35	40	45
50	55	60
65	70	75

Mystery Number Sort – 10s

Pre-Assessment

10	20	30
40	50	60
70	80	90
100	110	120
130	140	150

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1. What number pattern would you use to count the monkeys' eyes? Count by 2s Count by 3s Count by 5s Count by 10s 2. How many monkey eyes in all? Samantha was skip-counting by 5s. She missed a few numbers. What numbers did she miss? 25, 30, ____, ___, 50, 55, 60 4. Extend the number pattern: 10, 15, 20, _____ 5. The starfish's arms come in groups of:

6. Kevin was using a number pattern to count backwards. What number comes next in the sequence?

	70, 60, 50, 40,
7.	Why do you think it is sometimes important to count objects in groups? Support your answer with pictures and drawings.

Pre-Assessment Answer Key



What number pattern would you use to count the monkeys' eyes? Count by 2s Count by 3s Count by 5s Count by 10s 2. How many monkey eyes in all? 18 Samantha was skip-counting by 5s. She missed a few numbers. What numbers did she miss? 25, 30, <u>35</u>, <u>40</u>, <u>45</u>, 50, 55, 60 4. Extend the number pattern: 10, 15, 20, 25 The starfish's arms come in groups of:

6. Kevin was using a number pattern to count backwards. What number comes next in the sequence?

	70, 60, 50, 40, <u>30</u>						
7.	Why do you think it is sometimes important to count objects in groups? Support your answer with pictures and drawings.						
	Answers will vary but should touch on the fact that many times objects appear naturally in groups and it is faster to count large quantities by skip-counting grouped sets.						

Animal Cage Patterns



Scenario: Some animals have escaped from the zoo! Can you help put them back in their cages? Each cage can hold two animals. When you finish, count the total number of animals to tell how many in all.

Number of animals so far:	Number of	animals so far:	Nu	umber of animal	s so far:	
Number of animals so far:	Number of an	imals so far: _	Nu	umber of animal	s so far:	

Total number of animals if I had <u>one more</u> cage: ______

START HERE! Number Chart Game Board

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

FINISH HERE. YOU WIN!!!

START HERE!

Number Chart Game Board

	LIKL:			Application	n - Shadeo	1			
Ô	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

FINISH HERE. YOU WIN!!!

Assessment

Name:		Ticket
1. Continue the number pattern below:	~/	
8, 10, 12,	,	·
2. Extend the number pattern below:		
44, 46, 48,		•
Name:		Ticket
1. Continue the number pattern below:	4	IIVNU
8, 10, 12,	,	·
2. Extend the number pattern below:		
44, 46, 48,	,	•

DAY 2 MATERIALS

Exploring Skip-Counting with Pattern Blocks

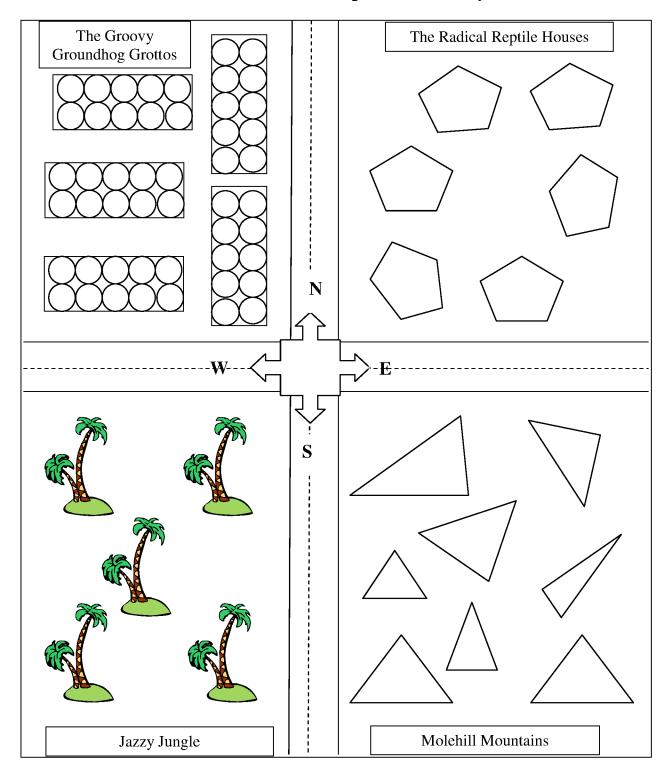
Exploration – Day 2

Number of Shapes	Total Number of Sides
1	
2	
3	
4	
5	

- The shape I used is a ______.
- It has _____ sides.

The Zany Zoo Map

Teacher Resource Explanation – Day 2



Animal Art Planning Card

Application - Day 2

Name:					
My art piece shows the number pattern:	Count by twos	Count by 5	fives	Co	unt by tens 10
I am showing my number pattern with:	Stripes	Spots	Ear	S	Eyes
My practice sketch looks like: lines below to find out how many are in a		objects are i	n your j	patter	n on the
			_		,

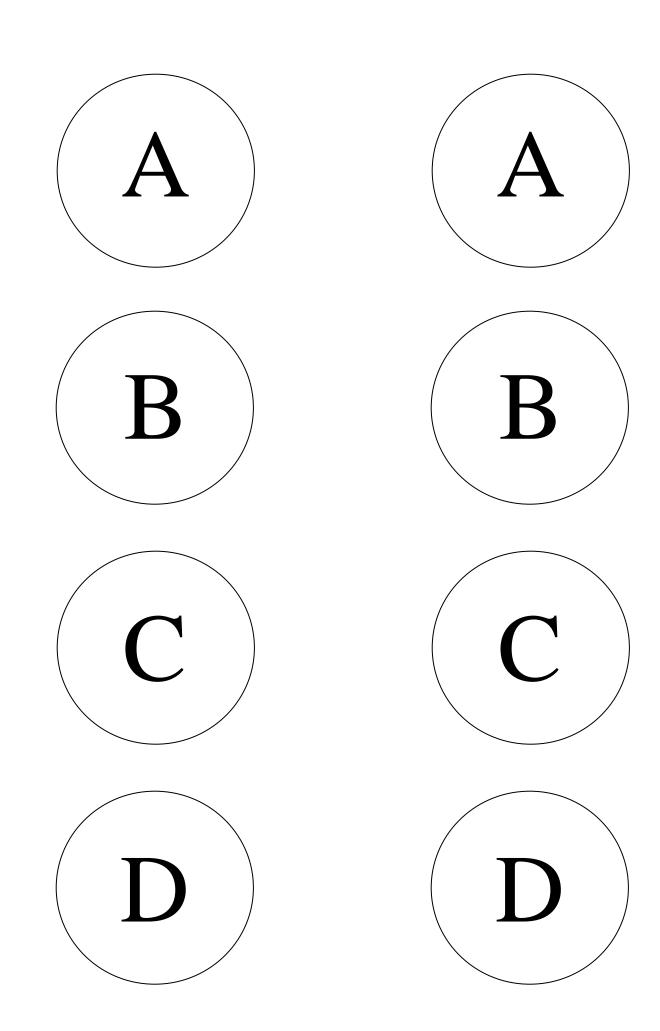
Name:			
My art piece shows the number pattern:	Count by twos	Count by five 5	S Count by tens 10
I am showing my number pattern with:	Stripes	Spots	Ears Eyes

My practice sketch looks like: (count how many objects are in your pattern on the lines below to find out how many are in all.)

Hundreds Chart

Application – Reteach Resource Day 2

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Assessment Pinch Card Question Sheet

Assessment – Day 2

1	•	e five bananas at lunch. He	ow many bananas did
the monkeys e	eat if there were 3 mc	onkeys?	
3	5	6	15
A	B	C	D
2. What number	comes next in the pa	ttern below?	
	60, 65, 70	0, 75,	
70	75	80	85
A	B	C	D
3. Find the missi	ing number in the seq	uence:	
	18, 20, 22	2, 24, 26, 28,	
28	29	30	38
A	B	C	D
4. Extend the par	ttern:		
	30,	40, 50,	
51	60	70	55
A	B	(C)	D

DAY 3 MATERIALS

Pre-Assessment Number Pattern Sort - 2s

Pre-Assessment – Day 3

2, 4, 6	68, 70, 72	34, 36, 38
12, 14, 16	30, 32, 34	16, 18, 20
72, 74, 76	80, 82, 84	48, 50, 52
64, 66, 68	4, 6, 8	08, 10, 12
20, 22, 24	70, 72, 74	94, 96, 98

Pre-Assessment Number Pattern Sort – 5s

Pre-A	ssessment	$-\mathbf{L}$	ay	3
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5, 10, 15	15, 20, 25	25, 30, 35
40, 45, 50	50, 55, 60	65, 70, 75
75, 80, 85	85, 90, 95	90, 95, 100
60, 65, 70	30, 35, 40	00, 05, 10
45, 50, 55	80, 85, 90	70, 75, 80

Pre-Assessment Number Pattern Sort – 10s

Pre-assessment – Day 3

00, 10, 20	10, 20, 30	20, 30, 40
30, 40, 50	40, 50, 60	50, 60, 70
60, 70, 80	70, 80, 90	80, 90, 100
90, 100, 110	100, 110, 120	110, 120, 130
120, 130, 140	130, 140, 150	140, 150, 160

Animal Rescue Recording Sheet

Application – Day 3

Animal	Total Animals Missing	Groups of Ten	Number Sequence	How many will be leftover for the final collection?
Butterfly	87	8	87, 77, 67, 57, 47, 37, 27, 17, 07	7

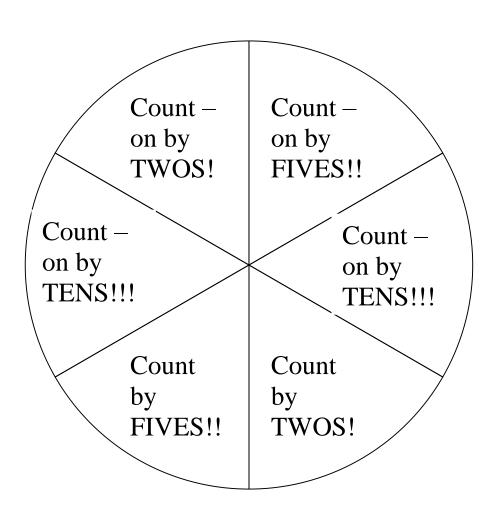
Hundreds Chart

Application – Reteach Resource Day 3

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Enrich Spinner

Application – Enrich – Day 3



The Zany Zoo Summative Assessment

Name
1. What is the skip counting rule?
5, 10, 15, 20, 25, 30
2. Continue the pattern.
2, 4, 6, 8,,
3. Fill in the missing numbers.
10, 20,, 40,, 70
 Ziggy the Zookeeper has 63 giraffes in a cage. He left to get food and when he returned there were only 23 giraffes

in the cage. Skip count backwards by tens from 63 to 23.

Brief Constructed Response
5. Identify the skip counting rule.
Part A What is the skip counting rule?
18, 20, 22, 24, 26
Part B Use what you know about skip counting to explain why your answer is correct. Use number and/or words in your explanation.

The Zany Zoo Summative Assessment Answer Key

Name	
Name	

1. What is the skip counting rule?

5, 10, 15, 20, 25, 30

count by 5's

2. Continue the pattern.

2, 4, 6, 8, 10, 12, 14

3. Fill in the missing numbers.

10, 20, 30, 40, 50, 60, 70

4. Ziggy the Zookeeper has 63 giraffes in a cage. He left to get food and when he returned there were only 23 giraffes in the cage. Skip count backwards by tens from 63 to 23.

63, 53, 43, 33, 23

5. **Step A**.

What is the skip counting rule?

18, 20, 22, 24, 26

count by twos

Step B.

Use what you know about skip counting to explain how you decided the rule.

Answers will vary, but students should mention that the number increases by two each time.